

WHAT IS CLAIMED IS:

- 1 1. A method of establishing bi-directional connectivity of a network
2 element in a network, the method comprising:
3 receiving a first unreliable packet from said network element;
4 storing an address of said network element in a neighbor pending list;
5 sending a reliable packet to said network element; and
6 if an acknowledgement to said reliable packet is received from said network
7 element,
8 accepting said network element as a neighbor.
- 1 2. The method of claim 1, wherein said unreliable packet does not require
2 a response.
- 1 3. The method of claim 1, wherein said reliable packet requires a
2 response.
- 1 4. The method of claim 1, wherein said accepting said network element
2 as neighbor is done by moving said address of said network element from said
3 neighbor pending list to a neighbor list.
- 1 5. The method of claim 4, further comprising:
2 if said address of said network element is in said neighbor list,
3 updating a neighbor hold count for said network element.
- 1 6. The method of claim 1, further comprising:
2 determining if said address of said network element is in a dampening list.
- 1 7. The method of claim 6, further comprising:
2 if said address of said network element is in said dampening list,
3 updating a value of a reliability count of said network element to
4 reflect higher reliability of said network element.

8. The method of claim 7, further comprising:
if said value of said reliability count is a maximum value,
moving said address of said network element from said dampening list
to said neighbor pending list.

9. The method of claim 8, wherein said maximum value is predetermined.

10. The method of claim 8, wherein said maximum value is dynamically
adjusted according to a traffic condition in said network.

11. The method of claim 6, further comprising:
if said network element is not in said dampening list,
adding said address of said network element to said dampening list,
and
setting said value of said reliability count of said network element to
said maximum value.

12. The method of claim 11, further comprising:
setting said neighbor hold count for said network element; and
sending a second unreliable packet to said network element.

13. The method of claim 1, further comprising:
initiating a neighbor pending timer.

14. The method of claim 12, further comprising:
if said acknowledgement to said reliable packet is not received before said
neighbor pending timer expires,
removing said address of said network element from said neighbor
pending list, and
updating said value of said reliability count to reflect lower reliability
of said network element.

15. The method of claim 12, further comprising:
 if said acknowledgement to said reliable packet is received before said
 neighbor pending timer expires,
 moving said address of said network element from said neighbor
 pending list to said neighbor list, and
 removing said address of said network element from said dampening
 list.

16. A system for establishing bi-directional connectivity with a network
 element in a network comprising:
 a central processing module; and
 a neighbor pending list coupled to said central processing module, wherein
 said central processing module is configured to store an address of said
 network element in said neighbor pending list while said network
 element is in a process of establishing said bi-directional connectivity
 with said system.

17. The system of claim 16, further comprising:
 an input-output module coupled to said central processing module, wherein
 said input-output module is configured to provide input-output
 interface to said central processing module; and
 a counter module coupled to said central processing module, wherein said
 counter module is configured to provide at least one of timing and
 counting functionality to said central processing module.

1 18. The system of claim 16, further comprising:
 2 a neighbor list coupled to said central processing module, wherein said
 3 neighbor list is configured to store said address of said network
 4 element after said bi-directional connectivity is established with said
 5 network element; and
 6 a dampening list coupled to said central processing module, wherein said
 7 dampening list is configured to store said address of said network
 8 element when a value of a reliability count in said counter module is
 9 lower than a maximum value.

1 19. The system of claim 18, wherein said maximum value is
 2 predetermined.

1 20. The system of claim 18, wherein said maximum value is dynamically
 2 adjusted according to a traffic condition in said network.
 3

1 21. A network device comprising:
 2 a processor; and
 3 a network interface coupled to said processor, said processor is configured to
 4 receive a first unreliable packet from said network element,
 5 store an address of said network element in a neighbor pending list,
 6 send a reliable packet to said network element, and
 7 if an acknowledgement to said reliable packet is received from said
 8 network element,
 9 accept said network element as a neighbor.

1 22. The network device of claim 21, wherein said unreliable packet does
 2 not require a response.

1 23. The network device of claim 21, wherein said reliable packet requires a
 2 response.

24. The network device of claim 21, wherein said accepting said network element as neighbor is done by moving said address of said network element from said neighbor pending list to a neighbor list.

25. The network device of claim 24, wherein said processor is further configured to
if said address of said network element is in said neighbor list,
update a neighbor hold count for said network element.

26. The network device of claim 21, wherein said processor is further configured to
determine if said address of said network element is in a dampening list.

27. The network device of claim 26, wherein said processor is further configured to
if said address of said network element is in said dampening list,
update a value of a reliability count of said network element to reflect
higher reliability of said network element.

28. The network device of claim 27, wherein said processor is further configured to
if said value of said reliability count is a maximum value,
move said address of said network element from said dampening list to
said neighbor pending list.

29. The network device of claim 28, wherein said maximum value is predetermined.

30. The network device of claim 28, wherein said maximum value is dynamically adjusted according to a traffic condition in said network.

1 31. The network device of claim 6, wherein said processor is further
2 configured to
3 if said network element is not in said dampening list,
4 add said address of said network element to said dampening list, and
5 set said value of said reliability count of said network element to said
6 maximum value.

1 32. The network device of claim 31, wherein said processor is further
2 configured to
3 set said neighbor hold count for said network element; and
4 send a second unreliable packet to said network element.

1 33. The network device of claim 31, further comprising:
2 initiate a neighbor pending timer.

1 34. The network device of claim 32, wherein said processor is further
2 configured to
3 if said acknowledgement to said reliable packet is not received before said
4 neighbor pending timer expires,
5 remove said address of said network element from said neighbor
6 pending list, and
7 update said value of said reliability count to reflect lower reliability of
8 said network element.

1 35. The network device of claim 32, further comprising:
2 if said acknowledgement to said reliable packet is received before said
3 neighbor pending timer expires,
4 move said address of said network element from said neighbor pending
5 list to said neighbor list, and
6 remove said address of said network element from said dampening list.

36. A network device comprising:
means for receiving a first unreliable packet from said network element;
means for storing an address of said network element in a neighbor pending
list;
means for sending a reliable packet to said network element; and
means for accepting said network element as a neighbor if an
acknowledgement to said reliable packet is received from said
network element.

37. The network device of claim 36, wherein said unreliable packet does
not require a response.

38. The network device of claim 36, wherein said reliable packet requires a
response.

39. The network device of claim 36, wherein said accepting said network
element as neighbor is done by moving said address of said network element from
said neighbor pending list to a neighbor list.

40. The network device of claim 39, further comprising:
means for updating a neighbor hold count for said network element if said
address of said network element is in said neighbor list.

41. The network device of claim 36, further comprising:
means for determining if said address of said network element is in a
dampening list.

42. The network device of claim 41, further comprising:
means for updating a value of a reliability count of said network element to
reflect higher reliability of said network element if said address of said
network element is in said dampening list.

43. The network device of claim 42, further comprising:
means for moving said address of said network element from said dampening list to said neighbor pending list.

44. The network device of claim 43, wherein said maximum value is predetermined.

45. The network device of claim 43, wherein said maximum value is dynamically adjusted according to a traffic condition in said network.

46. The network device of claim 41, further comprising:
means for adding said address of said network element to said dampening list if said network element is not in said dampening list, and
means for setting said value of said reliability count of said network element to said maximum value if said network element is not in said dampening list.

47. The network device of claim 46, further comprising:
means for setting said neighbor hold count for said network element; and
means for sending a second unreliable packet to said network element.

48. The network device of claim 36, further comprising:
initiating a neighbor pending timer.

49. The network device of claim 47, further comprising:
means for removing said address of said network element from said neighbor pending list if said acknowledgement to said reliable packet is not received before said neighbor pending timer expires, and
means for updating said value of said reliability count to reflect lower reliability of said network element if said acknowledgement to said reliable packet is not received before said neighbor pending timer expires.

50. The network device of claim 47, further comprising:
means for moving said address of said network element from said neighbor
pending list to said neighbor list if said acknowledgement to said
reliable packet is received before said neighbor pending timer expires,
and
means for removing said address of said network element from said
dampening list if said acknowledgement to said reliable packet is
received before said neighbor pending timer expires.

51. A computer program product for establishing bi-directional
connectivity of a network element in a network, encoded in computer readable media,
said program product comprising a set of instructions executable on a computer
system, said set of instructions configured to
receive a first unreliable packet from said network element;
store an address of said network element in a neighbor pending list;
send a reliable packet to said network element; and
if an acknowledgement to said reliable packet is received from said network
element,
accept said network element as a neighbor.

52. The computer program product of claim 51, wherein said unreliable
packet does not require a response.

53. The computer program product of claim 51, wherein said reliable
packet requires a response.

54. The computer program product of claim 51, wherein said accepting
said network element as neighbor is done by moving said address of said network
element from said neighbor pending list to a neighbor list.

55. The computer program product of claim 4, wherein said set of instructions is further configured to:
if said address of said network element is in said neighbor list,
update a neighbor hold count for said network element.

56. The computer program product of claim 51, wherein said set of instructions is further configured to:
determine if said address of said network element is in a dampening list.

57. The computer program product of claim 56, wherein said set of instructions is further configured to:
if said address of said network element is in said dampening list,
update a value of a reliability count of said network element to reflect
higher reliability of said network element.

58. The computer program product of claim 57, wherein said set of instructions is further configured to:
if said value of said reliability count is a maximum value,
move said address of said network element from said dampening list to
said neighbor pending list.

59. The computer program product of claim 58, wherein said maximum value is predetermined.

60. The computer program product of claim 58, wherein said maximum value is dynamically adjusted according to a traffic condition in said network.

61. The computer program product of claim 56, wherein said set of instructions is further configured to:
if said network element is not in said dampening list,
add said address of said network element to said dampening list, and
set said value of said reliability count of said network element to said
maximum value.

62. The computer program product of claim 61, wherein said set of instructions is further configured to:
 set said neighbor hold count for said network element; and
 send a second unreliable packet to said network element.

63. The computer program product of claim 51, wherein said set of instructions is further configured to:
 initiate a neighbor pending timer.

64. The computer program product of claim 62, wherein said set of instructions is further configured to:
 if said acknowledgement to said reliable packet is not received before said neighbor pending timer expires,
 remove said address of said network element from said neighbor pending list, and
 update said value of said reliability count to reflect lower reliability of said network element.

65. The computer program product of claim 62, wherein said set of instructions is further configured to:
 if said acknowledgement to said reliable packet is received before said neighbor pending timer expires,
 move said address of said network element from said neighbor pending list to said neighbor list, and
 remove said address of said network element from said dampening list.